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Section----- (B)

Department----- BS Software Engineering

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Subject----- Object Oriented Programming

Examination----- Mid-Term

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Q1. What is Class and role of object in a Class, explain in detail with the help of suitable program?

Answer: Class

Collection of objects is called class. It is a logical entity.

A class can also be defined as a blueprint from which you can create an individual object. Class doesn't consume any space.

```
class hidayat
{
public static void main(String args[])
{
System.out.println("My Name is Hidayat Ullah Yousafzai");
}
}
```

Object

Any entity that has state and behavior is known as an object. For example, a chair, pen, table, keyboard, bike, etc. It can be physical or logical.

An Object can be defined as an instance of a class. An object contains an address and takes up some space in memory. Objects can communicate without knowing the details of each other's data or code. The only necessary thing is the type of message accepted and the type of response returned by the objects.

Example: A dog is an object because it has states like color, name, breed, etc. as well as behaviors like wagging the tail, barking, eating, etc.

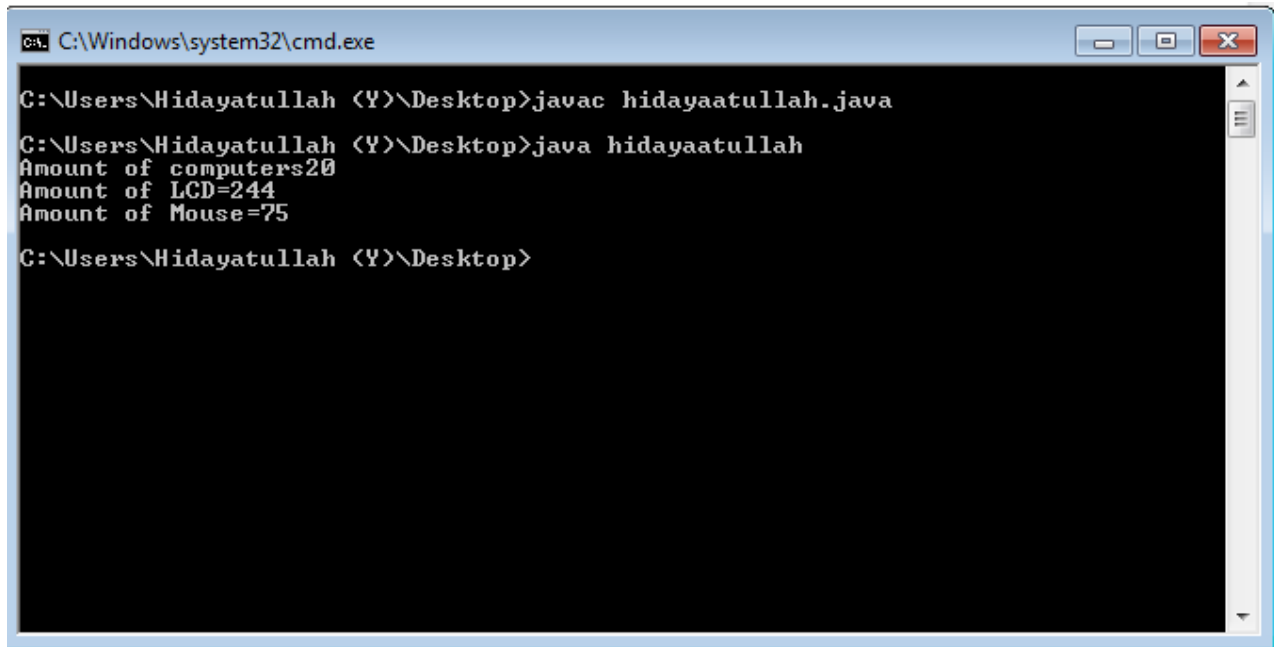
Role of Object in a Class

An Object can be defined as an instance of a class. Object determines the behavior of the class. When you send a message to an object, you are asking the object to invoke or execute one of its methods. From a programming point of view, an object can be a data structure, a variable or a function. It has a memory location allocated.

Program

```
class hidayaatullah
{
    public static void main (String args[])
    {
        shop items=new shop();
        System.out.println("Amount of computers" + items.computers);
        System.out.println("Amount of LCD=" + items.LCD);
        System.out.println("Amount of Mouse=" + items.mouse);
    }
}
class shop
{
    int computers=20;
    int LCD=244;
    int mouse=75;
}
```

Output of the above Program



```
C:\Windows\system32\cmd.exe
C:\Users\Hidayatullah <Y>\Desktop>javac hidayaatullah.java
C:\Users\Hidayatullah <Y>\Desktop>java hidayaatullah
Amount of computers20
Amount of LCD=244
Amount of Mouse=75
C:\Users\Hidayatullah <Y>\Desktop>
```

Explanation

First of all I mentioned the main class after this I wrote public static void main (String args[]) ,then I mentioned class name which is shop and also I mentioned an object by the name of items like this Shop items=new shop(); after these steps I wrote these all in order to display the result of items System.out.println("Amount of computers"+items.computers);

```
System.out.println("Amount of LCD"+items.LCD);
```

```
System.out.println("Amount of Mouse"+items.mouse);
```

```
}
```

Then I mentioned second class and also I took some variables and I declared and initialized them like this

```
class shop
```

```
{
```

```
int computers=20;
```

```
int LCD=244;
int mouse=75;
}
```

Q2. Write a program about table printing which takes input from the user on the basis of OOP and explain in detail.

Answer: Program about table

```
package tab;
import java.util.*;

public class tab {

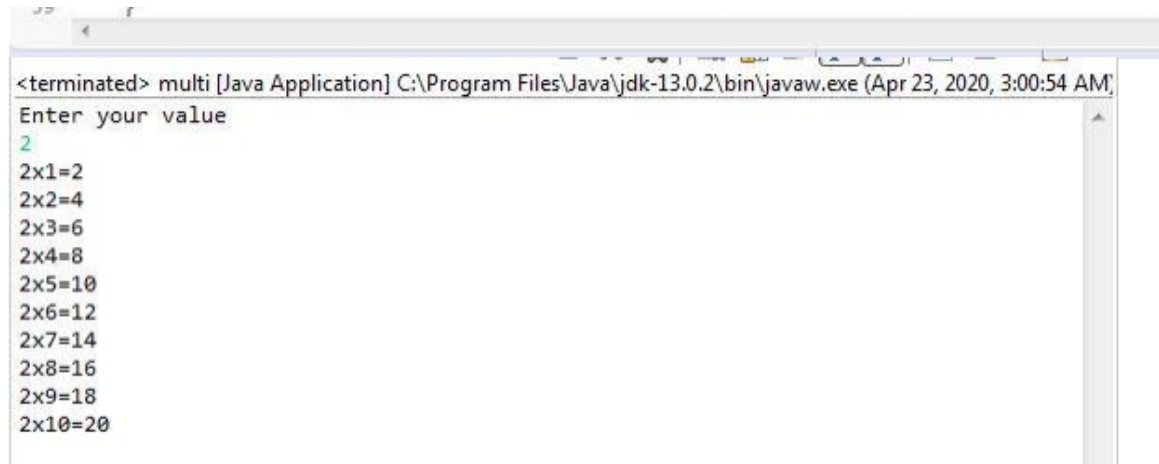
    public static void main(String[] args)

    {

        int number;
        Scanner tab=new Scanner(System.in);
        System.out.println("Enter your value=");
        number=tab.nextInt();
        for (int i=0;i<=10;i++)
        {

            System.out.println(number+"x"+i+"="+number*i);
        }
    }
}
```

Output of the above Program



```
<terminated> multi [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (Apr 23, 2020, 3:00:54 AM)
Enter your value
2
2x1=2
2x2=4
2x3=6
2x4=8
2x5=10
2x6=12
2x7=14
2x8=16
2x9=18
2x10=20
```

Explanation

First of all I opened eclipse, then I went to file > new > Java project and I gave the name > finish. After this I clicked on file which I created then new > I clicked on class .

After above procedure, I started writing the program in order to print any table.

first I mentioned the main function which **public static void main(String[] args)** after this I mentioned data type and variable, then I took and an object by the name of tab like this Scanner **tab=new Scanner(System.in);**

then I displayed a message to know what we should do just for understanding **System.out.println("Enter any number=");** at the end I used for loop to run table upto 10 like this **number=tab.nextInt();**

for (int i=0;i<=10;i++)

finally I run the program and got Correct result.

Q3. Write a program about any 2 cars which can calculate the performance of both of them and explain in detail.

Answer: Program

```
package vehicles;

public class vehicles
{
public static void main(String[] args)
{

    carper honda=new carper ();
    carper taxi=new carper ();
    honda.totalsp=100;
    honda.acceleratings=50;

    taxi.totalsp=60;
    taxi.acceleratings=45;

    System.out.println("Total speed of honda="
+honda.totalspeed +"KM/h");
    System.out.println("Accelerating speed of
honda=" +honda.acceleratings +"KM/h");
    System.out.println("Total speed of taxi="
+taxi.totalspeed +"KM/h");
    System.out.println("Accelerating speed of
taxi=" +taxi.acceleratings +"KM/h");

    taxi.perfo();
}

}

package cars;

public class carper {

    int totalspeed;
```

```

    int acceleratings;

    void perfo()
    {
        double per;

        System.out.println("performance=" + per);
    }
}

```

Explanation

First of all I opened eclipse, then I went to file > new > Java project and I gave the name > finish. After this I clicked on file which I created then new > I clicked on class .

In this program I created two classes one is main function class which name is vehicles and other is parent class which name is carper means car performance. I gave the names like carper and I took an object such as Honda and taxi like this

```

    carper honda=new carper ();
    carper taxi=new carper ();
    honda.totalsp=100;
    honda.acceleratings=50;

```

after this step I wanted to show them using this

```

    System.out.println("Total speed of honda="
+honda.totalspeed +"KM/h");
    System.out.println("Accelerating speed of
honda=" +honda.acceleratings +"KM/h");
    System.out.println("Total speed of taxi="
+taxi.totalspeed +"KM/h");
    System.out.println("Accelerating speed of
taxi=" +taxi.acceleratings +"KM/h");

```

Then I used another class in which I mentioned this `int totalspeed;`
`int acceleratings;`
at the I run my program and have gotten correct result.

Thank You My Respectable Teacher!